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AUG 0 6 2001
Environmental Cleanup Office

Possible Questions Related to Bunker Hill Mine Water Management Project
July 31, 2001

Sludge Disposal:

1. **The unlined sludge pond is the only remaining uncapped portion of the CIA. How much drainage from the CIA comes from the unlined sludge pond? How would future sludge ponds on the CIA affect current seepage from the CIA?**
   - The size of the unlined sludge pond is about 5 acres
   - An average of about 30 gpm drains or evaporates from the deposited sludge
   - Using an average precipitation rate of 33.0 inches, and assuming no evaporative loss, about 8.5 gpm infiltrates due to the precipitation
   - The combined drainage from the sludge and precipitation assuming no evaporation is about 42 gpm
   - Conversion to HDS will reduce the amount drained or evaporated from the sludge to about 3 gpm, and the total including precipitation (no evaporation) to about 12 gpm, a reduction of about 3.5 times.
   - The future ponds would be lined to collect the water from the sludge and precipitation. The collected water would be treated.

2. **Can new sludge ponds be safely constructed on top of the CIA liner? Even with a liner and effluent recycling system, couldn't new CIA sludge ponds fail? If so, wouldn't there be even more metals pollution to contend with in the river?**
   - The ponds can be constructed in a way that would not jeopardize the existing cover system.
   - Failure is possible, but very unlikely. The construction methods and materials are fairly standard and have been successfully used at many other sites.
   - If the lined system did completely fail (which is very unlikely) the amount of water moving into the CIA would be significantly less than current conditions (42 gpm currently, 12 gpm after HDS—see Question 1).

3. **Will the sludge require both a cap and a liner?**
   - Yes. Although the sludge is not a hazardous waste, a liner and cap would be used to reduce infiltration to the underlying CIA and to isolate the sludge.

4. **Why weren't other more local off-site sludge disposal areas considered in the RI/FS?**
   - The RI/FS looked at regionally existing disposal areas, which included the Graham Road facility near Spokane. The objective was to provide an order-of-magnitude cost estimate, not to predict exact disposal costs, since the specific location is unknown. To accomplish

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this, the costs for disposal at three facilities was averaged and used in the RI/FS.

5. **Will sludge disposal result in dust or other recontamination concerns?**
   - The existing sludge disposal area on the CIA has not been identified as a dust or recontamination problem. The surface of the sludge remains fairly moist, reducing the potential for dust. The future sludge ponds are expected to be similar. The sludge would not be excavated, and would be closed in place when each pond is full.
   - Off-site sludge disposal would require the sludge to be loaded into trucks and driven through the community. The trucks would be covered to prevent emissions.

6. **Why can't sludge be disposed in the mine?**
   - In-mine sludge disposal was considered, but no suitable locations could be identified. The possible areas either had too little capacity, too many unknowns, or very high costs.
   - In-mine sludge disposal could impact future mining operations, but could be viable if the mine uses a sand backfill system and the sludge can be incorporated in the fill.

7. **How much sludge is produced now and how would that change in the future if the CTP is upgraded?**
   - About 15,000 to 18,000 cubic yards of sludge per year is produced now and disposed in the existing CIA sludge pond.
   - Upgrading the CTP would drop the amount to about 5,400 cubic yards per year, about a 3-fold reduction.
   - If sludge from the upgraded CTP was mechanically dewatered for off-site transport, about 10,300 cubic yards per year would be produced. More is produced compared to on-site sludge pond disposal because mechanical dewatering is not expected to be as efficient.

8. **How is sludge dewatered? Does drying the sludge reduce its volume?**
   - Sludge of the type created at the CTP or the upgraded CTP is usually dewatered either by sludge drying beds or by mechanical means. Sludge drying beds use gravity, evaporation, and freeze/thaw cycles to remove water. Mechanical dewatering typically uses squeezing to remove water. Drying the sludge removes water and hence reduces the sludge volume. Every gallon of water removed reduces the volume by one gallon.

9. **Are there other areas of the site suitable for sludge disposal? How does disposal on the CIA impact future use of that area?**
   - Suitable locations are generally dry and flat. Sloping areas require more earth-work, and areas containing streams or runoff require more costly construction to isolate the sludge from the water. Nine areas on-site were evaluated during preparation of the RI/FS. The two considered most suitable were on top of the CIA or above the smelter closure area.

- Option A consists of disposing the sludge on top of the CIA into lined sludge disposal beds, which would be covered and capped when full. The cover would be similar to that used on the rest of the CIA. A single bed would have capacity for about 10 years, and would require about 4.5 acres. Once covered and capped, the land could be used similar to the rest of the CIA.

10. Will the sludge pose a long-term source of poor quality water?

- No. The sludge disposal area will have a bottom liner and water collection system.
- The collected water will be treated.
- When full the sludge disposal area will be capped.
- Water which drains from the sludge is expected to be of good quality because the metals are precipitated as solids, and the solids are filtered out in the drain system below the sludge.

Ownership/Operation of the CTP and Coordination with NBHMC:

11. Why are EPA and IDEQ funding and operating the treatment plant?

- Mine is privately owned, CTP owned by federal government
- State pays 10% of treatment costs, feds pay 90%
- Mine and CTP owned and operated by BLP until bankruptcy in 1991
- NBHMC purchase mine (not plant) from BLP
- Operation of CTP fell to Gulf/Pintlar (successors of BLP)
- EPA assumed the CTP, CIA, and a total of 1900 acres in November 1994 after bankruptcy of Gulf/Pintlar

12. Why didn't EPA sell NBHMC the CTP when they first expressed an interest?

- NBHMC has expressed interest in the past in purchasing the CTP as well as other site properties
- NBHMC was asked to provide an offer as well as financial information to support its ability to operate the CTP
- As no such information was received, a serious offer was not made

13. Who will eventually own and operate the treatment plant, and be responsible for long-term O&M costs?

- Before federal dollars can be spent, the Superfund law requires that the state agree to pay 10% of the costs of remedial action and to assume long term operation and maintenance for the remedy

- If a private party were to purchase the CTP, they would be responsible for long term O&M

14. What role has the NBHMC played in the RI/FS and remedy selection process? What role will they play in remedy implementation?

- EPA/IDEQ met with NBHMC early in the RI/FS scoping process (1998)
- NBHMC has received draft documents for comment, and participated in technical meetings as the RI/FS developed (1998 - 2000)
- NBHMC provided access to the mine for sampling, and shared knowledge of the mine and mine operations
- Information has been shared with NBHMC on activities that must be coordinated with NBHMC in order to implement any of the mine water alternatives in the RI/FS
- NBHMC has indicated that they will not express support or acceptance of any particular alternative until the end of the public comment period
- NBHMC has been notified as a responsible party at the Bunker Hill Superfund site
- EPA and DEQ believe that NBHMC has a role and responsibility in remedy implementation
- Following ROD amendment, EPA/IDEQ will seek to negotiate a legal agreement with NBHMC on what its specific role will be in remedy implementation

15. The proposed remedial alternatives are expensive! Who will pay for these costs? How long will this go on?

- Current technology is not capable of stopping acid mine drainage production
- Costs of collecting and treating AMD are expected to go on forever
- The preferred alternative seeks to reduce the amount of water that requires treatment by directing clean water from mine entry
- Unless a private party assumes the CTP, the federal govt. will pay for 90% of the costs of improvement, and the State of Idaho will pay for 10% of the costs of improvements and all of the costs of long term operations and maintenance

16. Do any of the actions in the RI/FS or proposed plan prevent the mine from operating?

- No. None of the proposed actions would prevent the mine from operating
- The NBHMC and the community have expressed a desire to keep the mine open and in operation
- This was a tenet as the RI/FS was developed

17. Are the actions outlined in the proposed plan helpful or hurtful to possible future full

operation of the mine?

- They are helpful. The purpose of the outlined actions is to most effectively manage the mine water—which must be done for both present and future mine operation.
- Present and future operation must be conducted in accordance with environmental regulations. The changes to be made at the CTP will allow these regulations to be complied with.
- The AMD flow reduction measures will reduce the amount of mine water. Less mine water benefits current and future mine operation.

18. Does the NBHMC presently pay for treatment of AMD?

- Since 1995, over 30 letters have been issued to NBHMC documenting monthly and cumulative water treatment costs. No payment has ever been received from NBHMC.
- EPA and DEQ believe that NBHMC is responsible for the costs of treating mine drainage
- Following ROD amendment, EPA/IDEQ will seek to negotiate a legal agreement with NBHMC to settle past costs for treatment and define its future role in remedy implementation
- EPA and DEQ believe that it is important to define NBHMC's role before any further public funds are spent on improving the existing treatment system
- The extent of NBHMC's responsibility will include consideration of its financial capabilities

19. Why should we spend so much money on a private mine when there are so many other pressing environmental problems in the basin?

- As the owner and operator of the CTP, EPA has a responsibility for ensuring that the plant is maintained in good working order and is capable of meeting current water quality requirements
- In addition, if no other party is identified, the State of Idaho would assume responsibilities for the long term operation and maintenance of the CTP. EPA wants to turn over to the State an upgraded plant in good working order.
- The CTP is almost 30 years old and has not been significantly upgraded.
- Failure of the CTP, which would result in untreated acid mine drainage being released to the SFCDR, would in fact be a pressing environmental problem. Untreated, acid mine drainage from the Bunker Hill mine would likely be the largest source of metals loading to the Coeur d'Alene River.
- For the 12 identified contaminants of concern, concentrations of metals in untreated acid mine drainage exceed protective water quality standards by 4 - 2,600 times
- A prolonged release of untreated acid mine drainage into the SFCDR would result in an acutely toxic shock to the aquatic system, resulting in the death of fish and invertebrate

species.

Coordination of Box and Basin Water Quality Issues:

20. What other contaminated water sources are treated at the CTP besides acid mine drainage from the Bunker Hill mine?

- Water from the following additional areas are currently treated at the CTP: drainage from the principal threat materials disposal cell in the industrial closure area, the toe drain from the industrial closure area landfill, two vehicle decontamination stations, occasional well development water, and drainage from the old mine water pipeline.
- AMD is the largest source, most acidic, and highest concentration of dissolved metals

21. Could the CTP be used to treat other contaminated water sources from the site (e.g., CIA seepage) or within the Basin?

- Yes. It is assumed that any additional contaminated site water sources in need of treatment (e.g., CIA seeps, contaminated surface and ground water) would be treated at the CTP
- The treatment plant could be expanded (to some extent) to take other contaminated water sources in the Basin
- While a maximum capacity has not been identified, physical space in which to expand the CTP would be a limiting factor
- Treatability tests of any "new" water sources would likely need to be performed to verify that the plant would continue to be able to meet water quality standards and TMDLs

22. Could the CTP successfully treat municipal wastewater in addition to what it currently treats?

- **No. Municipal wastewater contains organics and other constituents which make it incompatible with the water currently being treated.**
- **The processes used at the CTP are not suitable for municipal wastewater.**

23. How do EPA and IDEQ intend to coordinate water quality improvement projects throughout the Box and Basin with this acid mine drainage treatment proposal?

- It is assumed that treatment within the Box would be accomplished at the CTP
- The results of ongoing monitoring within the Box will be used to determine the need for further treatment of Box waters
- The Box site-wide monitoring program is currently being evaluated and enhanced in order to ensure the collection of data that will allow us to make those decisions (i.e., need for further treatment of Box waters)

- The Box and Basin teams are working together on this monitoring program evaluation in order to collect data that will allow us to compare Box sources to Basin sources
- This type of analysis will be used to set priorities for future project funding

24. What is the relative contribution of zinc to the South Fork from the "Box", and how does this compare to the amount of zinc in the mine water or existing CTP effluent?

- Approximately 2,000 lb/day of zinc is carried by the South Fork measured at the Pinehurst River Gauge. Of this, about 1,000 lb/day comes from the "Box".
- The mine water (untreated) carries about 3,100 lbs/day of zinc.
- The existing CTP discharges about 6 lbs/day of zinc.
- The upgraded CTP would discharge about 1.5 lbs/day of zinc.

Treatment Standards for the CTP:

25. Will the CTP require an NPDES permit? With what standards does the CTP have to comply?

- In the Superfund program, actions that occur as part of a cleanup do not need to obtain permits
- They must, however, comply with the substantive requirements of the permit
- The substantive requirements of the NPDES permit were determined to be the effluent limits and the monitoring requirements
- CTP effluent limits have been developed based on Idaho water quality standards for Arsenic, Copper, Mercury, Selenium, Silver, Thallium, the TMDLs for Cadmium, Lead, and Zinc, and the federal water quality criteria for Iron, Manganese, and Aluminum
- Monitoring will include effluent sampling, river flow, and toxicity testing
- See Bunker Hill CTP Discharge Quality and Monitoring Plan

26. What is it going to cost to meet the TMDL limits for the CTP and when will these limits be achieved?

- Tri-media filters are proposed for the CTP to reduce suspended solids and achieve TMDLs
- The cost of retrofitting the CTP with filters is approximately $3 million
- Filters are also desired for their ability to allow operation of the CTP in a way to cut sludge production by more than one-half, which will result in savings greater than the cost of the filters.
- Filters could be designed and installed in 8 - 12 months

- TMDL will be met when filters go on-line

27. Will achieving the TMDL limits at the CTP cleanup the Coeur d' Alene River?

- The CTP is only one of several point source discharges to the SFCDR. In addition, numerous non-point sources exist
- The TMDL is a water quality plan - each source needs to do its part
- Filters will reduce existing CTP discharges of Cd by 80%, Pb by 90%, and Zn by 75%
- A one-day discharge of untreated AMD for zinc=1.4 years discharge from existing plant or 5.6 years after filters
- Meeting TMDL is not sig. effort for CTP - costs not exorbitant, not exotic technology, would want filters anyway
- If don't fix up CTP and risk untreated AMD entering river will be made much worse, e.g., metals load in untreated AMD alone exceeds current load in river at Pinehurst

28. Are TMDLs appropriate cleanup goals?

- There is a long history of litigation and court-ordered schedules associated with the Coeur d'Alene Basin TMDL
- The Coeur d'Alene River is a large and significant resource with a history of active fisheries and clear impacts from mining
- The Cd'A Basin TMDL is a plan to achieve water quality standards and apportion responsibility among the various sources
- Attainment of the TMDL allocation for the CTP is achievable using current technology (tri-media filters) that is not considered to be significantly costly, and filters are desired anyway for their ability to cut sludge production.
- If don't fix up CTP (which is approaching 30 years old) then risk of untreated AMD entering river will be made much worse, e.g., metals load in untreated AMD alone exceeds current load in river at Pinehurst

29. I understand that the State of Idaho plans to propose site specific criteria for lead and zinc for the SFCDR. When would this happen and how would it impact the TMDL allocations for the CTP as well as other sources in the SFCDR?

- We understand that the site specific criteria should be out for public comment in August or September
- Following public comment the criteria would be reviewed by DEQ's water quality board, passed by the Idaho legislature, and then forwarded to EPA for approval
- The earliest estimate for when EPA may see the criteria for approval is April 2002

- If approved, dischargers in the SFCDR, including the CTP, should be able to discharge water with higher concentrations of lead and zinc than under the current standards
- EPA and IDEQ would recalculate the TMDL based on the site specific criteria

30. I understand that EPA has recently released more stringent aquatic life criteria for cadmium. How does this impact effluent releases from the CTP?

- EPA revised and reissued (April 2001) its aquatic life criteria for cadmium
- The new federal criteria are lower than before, and lower than the State's current water quality standard for cadmium
- The State of Idaho has not adopted the new lower criteria, or made a determination regarding whether the new lower criteria are appropriate for the Coeur d'Alene River
- Since NPDES permits are based on State water quality standards (not federal criteria), any permits issued would be based on the State water quality standards at the time of permit issuance. These permits would be updated to reflect any new standards adopted by the State upon their reissuance.
- The CTP, however, is not subject to a permit and is part of a Superfund action that must achieve all ARARs (i.e., federal water quality criteria and State water quality standards)
- Based on treatabililty testing results, average concentrations of cadmium in the CTP effluent (after filters) are expected to be below the new federal water quality criteria for cadmium

31. What are the human health and ecological concerns associated with exposure to untreated AMD? What are the benefits of the proposed actions in terms of human health and ecological risk reduction?

- EPA did a screening level risk assessment to compare levels of dissolved and suspended metals in untreated acid mine drainage to current water quality standards and criteria
- For the SFCDR, these standards and criteria are designed to be protective of aquatic organisms and human recreational uses (fishing, boating, wading and swimming) where ingestion of large amounts of water is not expected
- For the 12 identified contaminants of concern, concentrations of metals in untreated acid mine drainage exceed protective water quality standards by 4 - 2,600 times
- While the proposed actions will reduce existing CTP discharges of Cd by 80%, Pb by 90%, and Zn by 75%, these actions alone will not address all of the ails of the Coeur d'Alene River (e.g., current populations of benthic organisms and fish are low in the SFCDR, and about 30 miles of river are unable to sustain reproducing fish populations)
- EPA and IDEQ think that the bigger issue is what may occur if the CTP is not upgraded and maintained and untreated acid mine drainage is allowed to be discharged. For example, aquatic organisms are more sensitive than humans, and a prolonged release of

untreated acid mine drainage into the SFCDR would result in an acutely toxic shock to the aquatic system, resulting in the death of fish and invertebrate species.

32. How do the treatment standards included in the draft permits for the Lucky Friday, Coeur and Galena mines compare with expected effluent limits at the CTP?

- The CTP effluent limits were developed following the same procedures and requirements used for the other mines.
- The CTP limits are slightly more rigorous in that additional parameters have been added that were not required for the other mines (Al, Fe, Mn)
- The CTP limits do not benefit from a mixing zone, while the other mine do.

33. How do discharges from the Bunker Hill Mine compare to other mine's discharges?

- The Bunker Hill Mine discharges are generally more acidic, have higher metals concentration, and have higher flow
- In general the ore in the Bunker Hill Mine ore has more sulfide content
- The Bunker Hill Mine is bigger than most mines and mining took place closer to the surface resulting in the inflow of more water

34. Will the CTP be able to meet its assigned TMDL limits for cadmium, lead and zinc and water quality standards and criteria for other contaminants?

- Based on the treatability testing work conducted as part of the RI/FS, the CTP is expected to meet the TMDL limits for cadmium, lead and zinc and water quality standards and criteria for other contaminants.
- The limited duration study cannot be expected to provide definitive predictions, therefore testing of the upgraded CTP will be needed to confirm that the limits can be met.

35. What treatment technologies were considered for meeting the TMDL at the CTP? What were the results of the treatability study? How difficult would it be to add the sulfide precipitation technology to the CTP if necessary?

- The technologies considered were lime neutralization (existing process) either alone or with either iron co-precipitation, ion exchange, sulfide precipitation added, and filtration.
- The study found that the existing lime neutralization process with filtration could meet the TMDL. It also found that addition of sulfide precipitation could further reduce cadmium concentrations.
- Addition of sulfide precipitation would be relatively easy. The equipment needed is small and readily available. The required sulfide chemical is readily available from various vendors.

36. Is the treatment plant designed to produce a sludge that can easily be reprocessed in the future for metals recovery?

- The treatment plant is designed to produce a sludge which dewaters well and reduces disposal volume. These properties would likely help any future metal recovery process since the sludge will have less water in it.
- There is no known way to "easily" recover the metals. A process was developed by the U of I, but the process was only tested at the laboratory scale. It was not an easy process, and it was never demonstrated to be cost effective.
- The sludge is in known areas and accessible if an acceptable process is identified.
- A pilot-scale test would be needed to further evaluate and develop the U of I process.
- If the U of I process was found to be feasible, significant capital and O&M funds would be needed to build and operate it.

Source Control Measures:

37. How effective will source control measures be?

- A number of source control measures were evaluated.
- Each measure was estimated to have different potential effectiveness, but the specific effectiveness of each is unknown.
- In general the measures are expected to be more effective at reducing the peak mine water flows than the base flows.
- Of all the measures the West Fork Milo Creek diversions are considered to have the highest potential effectiveness. It is hoped that these will reduce peak mine water flows to less than about 2,500 gpm compared to 5,000+ gpm.

38. How will you decide whether additional source control measures should be implemented?

- The first set of measures will be monitoring for their effectiveness, including flow reductions achieved and treatment costs saved.
- Monitoring will consist of stream flows, groundwater depths, in-mine flows, and in-mine chemistry.
- The potential effectiveness of additional measures will be estimated using the monitoring results, and measures would be implemented if they have a good chance to cost-effectively reduce flows.

39. Doesn't it make sense to implement the source control actions first and wait for some time to see the results before making any changes to the CTP?

- No. The CTP is quite old and needs significant improvements even if the source control actions are effective. The CTP experiences periodic upsets, mostly due to the aging equipment, which result in the release of partially treated AMD to Bunker Creek.
- The source control actions will not eliminate all the mine water—thus the CTP will be needed no matter what.
- Many of the required changes are relatively independent of the size of flow reductions achieved, such as electrical upgrades and instrumentation and control upgrades.
- The filters are required to achieve the TMDLs even if the mitigations are very effective.

40. Is there acid coming from the hillsides or other areas before it gets into the mine?

- No. The acid is generated within the mine.

41. Why is Alternative 2 (treatment only) less expensive than alternatives employing source reductions? This doesn't make sense! Wouldn't source reduction result in less water to treat and therefore less cost?

- Alternative 2 is less expensive because: 1) the cost to build and operate the mitigations is estimated to be higher than resulting treatment and sludge management savings; 2) Alternative 2 does not include an upgraded in-mine storage and mine pool pump system whereas Alternatives 3, 4, and 5 do; and 3) Alternative 2 does not include the monitoring of surface streams and in-mine flows associated with the source reductions of Alternative 3, 4, and 5.

42. Didn't NBHMC already plug drill holes in the mine? What impact did this have on water flow from the mine?

- NBHMC plugged 72 drill holes between December 1994 and February 1995.
- The in-mine monitoring program conducted between October 1998 and September 1999 found mine water flows and chemistry to be similar to those in 1984 and 1985—the last time an in-mine study had been conducted.
- Because the flows and chemistry were found to be similar after drill hole plugging as compared to before, there is no indication that the plugging has made a significant impact on water flow from the mine.

43. Why is it proposed to plug additional drill holes?

- Plugging drill holes is typically relatively simple to do in compraison to other source reduction approaches
- If effective, a significant amount of water could be reduced.
- The costs for plugging is much less than other source control approaches.

44. Are there any water sources within the mine that could be isolated and discharged directly without treatment? With lower levels of treatment?

- Currently the mine water is treated at the CTP, for which a TMDL has been developed. The TMDL only allows a certain lbs/day of Cd, Pb, and Zn to be discharged.
- Within the mine there are water flows that are significantly cleaner than other flows—but even these cleaner flows contain metals. Collection and separate discharge of these flows would still have to comply with the TMDL, and would count towards the total amount per day of metal allowed to be discharged. Thus, less metal would be allowed to be discharged from the CTP, making treatment more difficult.
- Separate treatment of individual water sources would be more complicated and costly than using the CTP because the same type of treatment used by the CTP would be needed to reliably reduce metal concentrations. It would be simpler and less expensive to use the CTP compared to a separate treatment plant.

45. Would implementation of source control measures have any impacts on wildlife habitat or riparian areas?

- Source control measures located in streams would have some minor impact during construction, and some areas that currently have flowing streams would be dried up (South Fork).
- Most of these areas have already been impacted by past mining or remediation activities.
- A biological assessment was conducted which concluded there would be no significant impact to any protected species.

46. Why can't you stop all water from entering the mine?

- The mine is very large and underlies valleys and hillsides which receive a lot of rain and snow. The rain and snow soaks into the ground over the entire area above the mine. A portion of the water enters streams which overlie the mine, and a portion enters cracks, fissures, and faults within the ground which intersect the mine workings.
- Because the area of water infiltration is so large (many square miles) it is impossible to collect all of it, and prohibitively expensive to collect a high percentage.
- The more cost-effective way is to collect water from streams which are known to infiltrate the mine, because these areas are relatively small and can be addressed by building flow diversion structures to convey the water around infiltration areas.

47. Will the diversion structures outlined in the proposed plan cause increased flooding within the Milo Creek Drainage?

- No. The Milo Creek flood control system was sized to collect all potential water draining from the entire basin including the water which now infiltrates the mine.

Miscellaneous Technical Questions

48. Why can't metals be recovered from the sludge or acid mine drainage?

- Metals can be recovered from the sludge or AMD, but no economical processes have been identified.

49. Have cleanup and flood control actions in Milo Creek resulted in an increase in infiltration to the Bunker Hill mine?

- Historical information dating back to the 1970's indicates that infiltration into the Bunker Hill mine through the main stem of Milo Creek has occurred in the past
- It is possible that construction activities, e.g., stream bed excavation which could remove the accumulated fine sediment and metals precipitation layer, which could increase the permeability of the stream channel and result in increased infiltration to the mine
- In-mine monitoring data collected by EPA in 1998 and 1999 was inconclusive as to the degree of any current infiltration
- However, when compared to similar data collected in the mid-1980's, the 98/99 data indicates that flow volumes in those areas of the mine influenced by main stem Milo Creek area not significantly different

50. How soon would the proposed remedial actions start occurring? How long would they take to complete?

- Following issuance of a ROD amendment, EPA would enter into a contract with a firm to design the selected remedy
- EPA and IDEQ would also amend the existing State Superfund Contract providing State assurances for 10% of the remedial action costs and long term O&M
- Construction of the remedy components would take up to three years to complete
- Surface and in-mine monitoring to determine if additional flow reduction measures or treatment plant capacity is needed would occur for up to 10 years

51. What impact will in-mine water storage have on the Flood-Stanly ore body? Will in-mine storage cause the release of additional metals?

- In-mine water storage is not excepted to cause the release of significantly more metals from the Flood-Stanly ore body because nearly all of the ore body is located above areas which may be flooded by in-mine water storage.

52. Did EPA and IDEQ look at growing sulfide reducing bacteria within the mine?

- EPA and IDEQ did not look at growing sulfide reducing bacteria in the mine because the bacteria very likely already exist, especially in the mine pool, which has very little

oxygen.

- EPA and IDEQ did look at using the sulfate reduction capacity of the mine pool to treat the higher-strength mine waters by piping these waters into the pool below the surface down one of the mine shafts. Calculations showed that if sulfate reduction did occur, the dissolved metals would be converted to metal sulfides forming sludge which would rapidly fill the shaft rendering it unsuitable for mining and preventing further addition of higher-strength water. Therefore this concept was eliminated from further consideration.

53. Did EPA and IDEQ consider grouting fractures in the rock surface to prevent surface water from infiltrating the mine?

- Yes, but it was eliminated from further consideration due to lack of identified areas, low effectiveness, and high cost.

54. Exactly what changes or upgrades would be made to the CTP?

- Appendix E to the RI/FS describes the changes and upgrades required to modernize the plant, make it more reliable, and increase its efficiency.
- They include replacing worn equipment, modernizing the control system, raising the operational pH to increase removal of dissolved metals, and adding a tri-media filtration system for removal of suspended solids.

55. What impacts does the mine water have on the local site and regional groundwater systems?

- There are no known impacts from the mine water to the site local or regional groundwater.
- The mine water "pool" is kept pumped down to an elevation about 270 feet below the SFCdA River. This elevation is lower than the local site and regional groundwater systems. The lower level acts to contain the mine water and to keep it from affecting groundwater and river water.

<u>Related Issues for MKV to Coordinate with the Office of Water:</u>

56. What is the status of EPA's consideration of variances for the draft discharge permits for mining companies in the Silver Valley?

- Hecla submitted a request for a variance for lead and zinc discharges in February 2001
- The request is being reviewed by EPA and IDEQ to determine what if any additional information is needed to process the request
- Because variances are relatively unusual, and because the supporting information required is detailed, the variance process is expected to take some time
- An NPDES permit can be modified if a variance is approved

57. Will EPA consider site specific criteria in issuing the discharge permits?

- EPA will not consider site specific criteria until they are formally approved
- IDEQ is beginning a rulemaking process this summer to establish site specific criteria for the SFCDR
- Once Idaho has completed its work, they will submit their new criteria to EPA for federal approval
- This is expected sometime in the Spring of 2002
- If these criteria are approved, NPDES permits will be modified accordingly

58. Do the SSC being proposed for lead and zinc apply to the entire SFCDR?

- A site specific study for cadmium, lead and zinc was completed by Hecla Mining Company and IDEQ for the eight-mile SFCDR stretch between Daisy Gulch and Canyon Creek
- The study shows that the aquatic life in this portion of the SFCDR can tolerate greater concentrations of lead and zinc than Idaho's current water quality standards
- Hecla and IDEQ are currently working to extrapolate the eight-mile stretch data to the entire SFCDR
- It is our understanding that the site specific criteria proposed later this summer for public comment will apply to the entire SFCDR

59. What is the schedule for proposing and approving SSC? When is the earliest they could take effect? When would the TMDL for the SFCDR be revised based on any approved SSC? Any idea of how the SSC, if approved, would impact the TMDL?

- We understand that the site specific criteria should be out for public comment in August or September, 2001
- Following public comment the criteria would be reviewed by DEQ's water quality board, passed by the Idaho legislature, and then forwarded to EPA for approval
- The earliest estimate for when EPA may see the criteria for approval is April 2002
- EPA and IDEQ would recalculate the TMDL based on the site specific criteria after formal approval. Permits would be updated based on the recalculation.
- If site specific criteria are approved and the TMDL is recalculated, dischargers in the SFCDR, including the CTP, should be able to discharge water with higher concentrations of lead and zinc than under the current standards

Feasibility Study and Proposed Plan:

60. Why is Alternative 3 the preferred alternative?

- Alternative 3 is the preferred alternative because it is protective, meets ARARs, and provides the best balance between reducing mine water flows and required treatment plant size.
- It incorporates the flow reduction measures believed to be the most effective.
- It utilizes a phased approach to evaluate the effectiveness of the initial flow reduction measures and the initial treatment plant size.

61. Since Alternative 4 is only slightly more expensive, and since it protects from potential high inflow to the mine, why isn't it the preferred alternative?

- The only difference between Alternatives 3 and 4 is that Alternative 4 initially implements two more flow reduction measures which based on existing information may not be needed.
- Alternative 3 would implement these additional measures if they are determined to be needed.

62. Why not select Alternative 2? It costs less than Alternative 3.

- Alternative 2 costs less, but EPA and IDEQ believe the higher cost of Alternative 3 is worth it.
- Alternative 3 includes source control measures which are expected to reduce peak flows and make the mine water more manageable and less likely to exceed the capacity of downstream management systems.
- Because Alternative 2 has no source reduction measures, it results in more water being treated, more sludge generated, and more CTP effluent being discharged.
- Alternative 2 has higher treatment and sludge management costs than Alternative 3.

63. Why not select Alternative 5? It has the most flow reduction measures.

- The additional flow reduction measures may not provide significantly greater mine water flow reductions compared to Alternative 3. This is because the specific effectiveness of the additional measures is unknown.
- The phased approach of Alternative 3 will allow the effectiveness of the source control measures to be evaluated before additional ones are constructed.
- The additional source control measures are costly. Given the uncertainty in their effectiveness, they may not be worthwhile and may end up costing more than they save. The phased approach of Alternative 3 will help determine if the additional source control measures are warranted.

64. The proposed CTP is sized for a capacity of 2,500 gpm. What is the capacity of the existing CTP, and is 2,500 gpm sufficient? How was this capacity determined?

- The existing CTP has a capacity of about 3,500 to 4,000 gpm. The 2,500 gpm size for the upgraded CTP was determined by evaluating historic mine water flows in conjunction

with estimated source control mine water flow reductions.

- The evaluations indicated that a 2,500 gpm capacity treatment plant may be sufficient if the source control measures of Alternative 3 can reduce the peak flows.
- The 2,500 gpm capacity is really the capacity of the filter system. The rest of the plant would have a 5,000 gpm capacity, because the extra 2,500 capacity is very cost-effectively added by enlarging pipes and adding additional lime feeding capability. This provides the capability to raise the pH, precipitate out the metals, and to gravity clarify 5,000 gpm, and to filter 2,500 gpm. The non-filtered portion would be significantly better water quality than untreated mine water. The quality would be more similar to that of current CTP effluent.

65. What is the potential for mine water flows to be higher than 2,500 gpm even if the source control measures are constructed? Could the source control measures fail, resulting in more than 2,500 gpm of mine water? What would happen if this occurred?

- The specific potential for flows to be higher than 2,500 gpm after source control implementation is unknown, but the evaluations suggest that peak flows are associated with surface water infiltration to the mine workings, particularly in the West Fork drainage.
- The West Fork Diversion and Rehabilitating the Phil Sheridan Raises are source control measures specifically aimed at reducing West Fork inflow to the mine.
- The improved in-mine storage system and the existing lined pond provides safeguards in the event that flows exceed 2,500 gpm. The excess flow would be diverted into the mine pool or into the lined pond, and eventually pumped out and treated once the flows dropped below 2,500 gpm.
- The potential for the source control measures to fail will be reduced by constructing them robustly. Measures will be taken to reduce the potential for clogging the inlet works by debris.

66. Would all the remedial actions of the selected alternative be done at once, or would they be implemented over time as funding becomes available?

- That has not been determined yet, and will be dependent on available state and federal funding, the state Superfund contract, and the arrangement reached with the NBHMC.